

Robber flies of the genus *Trichardis* (Diptera: Asilidae) of the Palaearctic

Ктыри рода *Trichardis* (Diptera: Asilidae) Палеарктики

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The Palaearctic species of the genus *Trichardis* Hermann, 1906 are reviewed. A new species, *T. lehri* **sp. nov.**, is described. A new synonymy is established: *T. leucocoma* (van der Wulp, 1899) = *T. afanasievae* Lehr, 1964, **syn. nov.** The male of *T. mongolica* V. Richter, 1972 is described for the first time. External features and the male genitalia of *T. lehri* **sp. nov.**, *T. leucocoma* (van der Wulp, 1899) and *T. mongolica* V. Richter, 1972 are illustrated with photographs.

Выполнен обзор Палеарктических видов рода *Trichardis* Hermann, 1906. Описан новый вид *T. lehri* **sp. nov.** Установлена новая синонимия: *T. leucocoma* (van der Wulp, 1899) = *T. afanasievae* Lehr, 1964, **syn. nov.** Впервые описывается самец *T. mongolica* V. Richter, 1972. Детали внешнего строения и генитальных структур самцов *T. lehri* **sp. nov.**, *T. leucocoma* (van der Wulp, 1899) и *T. mongolica* V. Richter, 1972 проиллюстрированы фотографиями.

Key words: robber flies, morphology, male genitalia, Diptera, Asilidae, *Trichardis*, new species, new synonymy

Ключевые слова: ктыри, морфология, гениталии самца, Diptera, Asilidae, *Trichardis*, новый вид, новая синонимия

INTRODUCTION

The genus *Trichardis* Hermann, 1906 is predominantly Afrotropical, with 25 species known from the Afrotropical Region (Londt, 2008). One species, *T. indica* Londt, 2008, was described from India, the Oriental Region (Londt, 2008). Four species are known from the Palaearctic Region: *T. afanasievae* Lehr, 1964, *T. cinctella* Séguy, 1934, *T. leucocoma* (van der Wulp, 1899) and *T. mongolica* V. Richter, 1972 (Lehr, 1988; Séguy, 1934). Of these, *T. cinctella* is known only from North Africa (Séguy, 1934).

The genus *Trichardis* is characterized by the following morphological features: postpedicel moderately elongated or club-shaped; proboscis small, barely protruding beyond the lower margin of face (Figs 1–2,

14–15, 29–30); hind tibia without spur at apex; hind femur thickened (Figs 47–49); gonocoxites rarely with medial projections (short if present) and as a rule with medially directed macrosetae (Figs 9–10, 22–23, 38–39) (Lehr, 1969; Londt, 2008). The genus belongs to the tribe Hoplistomerini Enderlein, 1936, which includes two genera, *Trichardis* and *Hoplistomerus* Macquart, 1838. Representatives of the tribe are distinguished from similar species in other tribes by the features of wing venation (Figs 3, 16): cell r_1 closed or petiolate, cells r_5 and m_3 closed, petiolate (Dikow, 2009).

MATERIAL AND METHODS

The paper is based on the collection of the Zoological Institute, Russian Academy

of Sciences, St Petersburg (ZIN). The author examined in detail the Palearctic material of *T. afanasievae* Lehr, 1964, *T. leucocoma* (van der Wulp, 1899) and *T. mongolica* V. Richter, 1972. The classification and nomenclature follow Dikow (2009). All the material examined, including the types of *T. lehri* sp. nov., is housed in ZIN.

The terminalia of males were removed and macerated in warm KOH solution; the genital structures were examined in glycerol and kept in microvials pinned with the respective specimens. The photographs were made with a Leica MZ9.5 stereomicroscope and a Leica DFC290 digital camera. To achieve sufficient depth of focus, several separate shots were combined with the stacking program Helicon Focus 6. Post-processing was done in Gimp 2.

SYSTEMATIC PART

Order DIPTERA

Family ASILIDAE

Subfamily LAPHRIINAE

Tribe HOPLISTOMERINI

Genus *Trichardis* Hermann, 1906

Trichardis cinctella Séguéy, 1934

Distribution. North Africa: Tunisia (Séguéy, 1934).

Notes. The material of this poorly known species was not available for the study, so it was not included in the key.

Trichardis indica Londt, 2008

Distribution. India (Londt, 2008).

Notes. The holotype (male) and the paratype (female) were collected from the Himalayas (Kurséong; 1500 m), and one more male, in South India (Londt, 2008). Hence, *T. indica* is known from the Palearctic Region (Himalayas) and included in the key based on the published data (Londt, 2008).

Trichardis leucocoma

(van der Wulp, 1899)

(Figs 14–28, 47)

Strobilothrix albipila Becker, 1907: 43–44.

Trichardis leucocomus: Hull, 1962: 97; Lehr, 1988: 212 (incorrect subsequent spelling).

Triclis rufescens Austen, 1914: 267.

Trichardis afanasievae Lehr, 1964: 914–915, **syn. nov.**

Syntypes of *T. afanasievae*. Two females; **Uzbekistan**, *Bukhara Prov.*, SE suburb of Kyzylkum, 22 July 1961 (Nikolaev leg.).

Other material examined. **Kazakhstan**, *Mangystau Prov.*, Aktau, 9 June 1925, 1 female (Gussakovsky leg.). **Uzbekistan**, *Bukhara Prov.*, Kyzylkum, 70 km NW of Gazly, sands, 27 May 1965, 1 male (Zaitzev leg.). **Turkmenistan**: *Balkan Prov.*, Akhcha-Kuyma station, 7 July 1934, 1 male (Popov leg.); *Ahal Prov.*, 24 km S of Bakhardok, sands, 25 July 1973, 1 female (Zaitzev leg.); *Lebap Prov.*, 25 km WSW of Lebap, Zaunguz Karakum, sands, 17 June 1978, 2 males, 2 females (Zaitzev leg.); Amu Darya River near Gadin 30 km NW of Farab, 14 June 1981, 1 male (Galygina leg.); 20 km W of Kerki, sands, 20 June 1971, 2 males (Zaitzev leg.); Repetek, on sand, 7 May 1947, 1 male (Arnoldi leg.); Repetek, 2–3 June 1969, 4 males, 2 females (Zaitzev leg.); *Ashgabat*, 10 July 1925, 1 male (Gussakovsky leg.); *Mary Prov.*, Mary, 9 June 1961, 1 male (Charykuliev leg.); Hauz-Han, 80 km W of Mary, 11 June 1971, 4 males, 1 female (Zaitzev leg.); 60 km WNW of Chemenibita, Badkhyz Nature Reserve, 8 Aug. 1973, 1 female (Zaitzev leg.). **Israel**, *Southern Prov.*: Central Negev, Hamakhtesh Hagadol, 12 km ESE of Yeroham, 11 July 1996, 1 female (Shibanova leg.); same data, 1 female (Zaitzev leg.).

Notes. *Trichardis leucocoma* was described from Yemen (Londt, 2008). I examined the syntypes of *T. afanasievae* (females) from Uzbekistan and numerous specimens from adjacent areas, as well as two females of *T. leucocoma* from Israel. Lehr (1964) used the features of external morphology and some external characters of the male genitalia for distinguishing *T. afanasievae* and *T. leucocoma* in the key. The details of the male genitalia of *T. leucocoma* from Israel (Theodor, 1980) are very similar to those of *T. afanasievae* in our ma-

terial (Figs 17–26). No external characters for distinguishing the two species were observed either. Hence, the name *T. afanasievae* Lehr is considered here as a junior synonym of *T. leucocoma* van der Wulp.

Distribution. Palaearctic Region: Kazakhstan, Uzbekistan, Turkmenistan, Iran, Mongolia, Saudi Arabia, Israel, Egypt, Algeria (Lehr, 1988; Londt, 2008). Afrotropical Region: Niger, Yemen (Londt, 2008).

***Trichardis lehri* sp. nov.**

(Figs 1–13, 48)

Holotype. Male; **Uzbekistan**, *Bukhara Prov.*, Bukhara, 21 June 1930 (Zimin leg.).

Paratypes. **Uzbekistan:** *Samarkand Prov.*, Kattakurgan, 1931 [year indicated only], 1 male (Gussakovsky leg.); *Bukhara Prov.*, Bukhara, 18 June 1928, 1 male (Zimin leg.); Bukhara, 1 Aug. 1928, 2 males, 1 female (Zimin leg.); Bukhara, 8 July 1930, 1 male (Zimin leg.); Bukhara, 17 June 1930, 2 males, 1 female (Zimin leg.); Bukhara, 21 June 1930, 1 male (Zimin leg.); Bukhara, 21 June 1930, 1 male [collector not indicated]. **Turkmenistan:** *Balkan Prov.*, Kopet Dag, Sumbar Valley, Kara-Kala, 14 July 1972, 1 male (Nartshuk leg.); Kopet Dag, Yarty-Kala at Chandyr River, 19 Aug. 1934, 1 female (Popov leg.); *Mary Prov.*, Meruchak, 20 July 1926, 1 female [collector not indicated]. **Tajikistan**, *Khatlon Prov.*, Gazim-Alik, 45 km W of Kurgan-Tyube, 800 m, pistachio semisavanna, 20 June 1964, 1 male (Sugonyaev leg.).

Description. Head. Face and frons densely white setose, vertex covered with silvery white pollen; frons on both sides finely white setose; ocellar macrosetae long, white (Figs 1–2). Palpi reddish yellow, with long sparse fair setae (Figs 1–2). Facial setae white; postocular setae dense, white. Antennae reddish yellow; postpedicel spindle-shaped, more than twice as long as pedicel (Figs 1–2).

Thorax. Mesonotum covered with dense accumbent white setae, greyish brown pollinose. Lateral surfaces with silvery pollination. Scutellum with numerous thin light-coloured setae. Legs densely covered with white setae; fore and mid femora reddish brown, hind femora predominantly brown; fore and mid tibiae reddish yellow, hind tib-

iae reddish yellow with brown apices; tarsi reddish yellow; claws black. Wing glassy transparent (Fig. 3); veins reddish brown; vein *r-m* before the middle of cell *d*.

Male abdomen grey pollinose; sternites with sparse thin white setae; tergites with thin accumbent white setae.

Male genitalia (Figs 4–13) reddish brown; epandrium slightly convex, solid, straight along the posterior margin, covered with dense light-coloured setae on outer surface; gonopod with numerous light-coloured setae on outer side; gonocoxite wide, slightly elongate, rounded at posterior margin; lateral process of gonocoxite slightly curved, tapering from base to apex, pointed at apex; gonostylus elongate, slightly curved in the middle, tapering to apex, apex not pointed; aedeagus short, with three slightly curved apical branches; ejaculatory apodeme large; hypandrium small, triangular, pointed at apex.

Body length 10–11 mm.

Female. Similar to male.

Comparison. Previously the species was reported as *T. leucocoma* (van der Wulp) (Lehr, 1964). *Trichardis lehri* sp. nov. differs from *T. leucocoma* and *T. mongolica* V. Richter, 1972 in the vein R_{2+3} not curved at the apex (Fig. 3) and the hypandrium with wide barely noticeable projection in the middle of anterior margin (Fig. 13). *Trichardis mongolica* differs from *T. lehri* sp. nov. also in the predominantly brown coloration. The male genitalia of *Trichardis lehri* sp. nov. differ from those of the paralectotype(?) of *T. leucocoma* as depicted by Londt (2008: 219, Figs 27–28; “paratype”).

Etymology. The species is named in honour of P.A. Lehr.

Distribution. Uzbekistan, Turkmenistan, Tajikistan (Fig. 50).

***Trichardis mongolica* V. Richter, 1972**
(Figs 29–46, 49)

Holotype (?). Female; **Mongolia**, *Bayan-Hongor Aimag*, Edringiyn-Nuru Ridge, 100 km SSW of Bayan-Under, 5 Sept. 1970 (Zaitzev leg.).

Other material examined. **Mongolia**, Bayan-Hongor Aimag, Ehiyn Gol tract 50 km NNE of Tsagaan-Bogdo, 1 Sept. [1]970, 1 male (Zaitzev leg.), "*Trichardis mongolica* V. Richter det."

Description of male. External features of male (Figs 29, 30, 33) very similar to those in female (Figs 31, 32, 34), as described by Richter (1972). Body length 10.5–11 mm.

Male genitalia (Figs 35–44) reddish brown; epandrium slightly convex, solid, straight along posterior margin, covered with dense thin light-coloured setae on outer surface; gonopods with numerous light-coloured setae along posterior margin; gonocoxite with a shallow median notch along posterior margin; lateral process of gonocoxite short, slightly curved, tapering from base to apex, pointed at apex; gonostylus short, slightly curved in the middle, tapering to apex, pointed at apex; aedeagus short, with three slightly curved apical branches; ejaculatory apodeme large; hypandrium small, triangular, pointed at apex, with a small semicircular notch at anterior margin.

Comparison. See under *T. lehri* sp. nov.

Distribution. Mongolia (Fig. 50).

Notes. V.A. Richter described *T. mongolica* from the holotype, female, and gave the label "Mongoliya, Bayan-Hongorskiy aimak, oasis Ekhn-Gol, 11–14 VIII 1969 (Zaitzev)" in the original description (Richter, 1972: 787). Later, she published the records of two additional specimens, male and female, collected in 1970 (Richter, 1974: 304). Subsequently, Richter labelled the female collected in 1970 as the holotype (Fig. 45) and suggested that the label published in the original description was erroneous (Richter, pers. comm.). Both the specimens collected in 1970 are kept in the collection (see "Material"), but no specimen was found with the label corresponding to that in the original description. It is not completely clear if the female collected in 1970 does represent the holotype considering that only few materials collected in this year were mentioned in volume 1 of *Nasekomye Mongolii* (Kerzhner, 1972).

A key to Palaearctic species of the genus *Trichardis*

- 1(2). Antenna red-brown. Hypandrium greatly reduced (Londt, 2008: 224, Fig. 56) *T. indica*
- 2(1). Scape and pedicel yellowish red; postpedicel yellowish brown with lighter basal half (Figs 29–34, 47–49). Hypandrium well-developed (Figs 13, 26, 44).
- 3(4). Vein R_{2+3} slightly bent near apex (Fig. 3). Hypandrium with wide barely visible projection in the middle of anterior margin (Fig. 13) *T. lehri* sp. nov.
- 4(3). Vein R_{2+3} bent at an angle of 90° near apex (Fig. 16). Hypandrium with a small semicircular or a large triangular notch in the middle of anterior margin (Figs 26, 44).
- 5(6). Mesonotum (Fig. 47) with dense white setae. Wings transparent with reddish brown veins (Fig. 16). Male genitalia (Figs 17–26): gonocoxite wide, slightly elongate, rounded at the posterior margin; gonostylus elongate, strongly curved in the middle, tapering to apex, apex not pointed; hypandrium small, triangular, with a deep notch at the anterior margin, pointed along the posterior margin *T. leucocoma*
- 6(5). Mesonotum (Figs 33–34) with dense grey pollen laterally, covered with accumbent white setae, with a black median stripe. Wing transparent with yellow veins (Fig. 49). Male genitalia (Figs 35–44): gonocoxite short, rounded, with a shallow median notch at the posterior margin; gonostylus short, strongly curved in the middle, tapering towards the apex, apex pointed; hypandrium small, triangular, pointed at apex, with a small semicircular notch at the anterior margin *T. mongolica*

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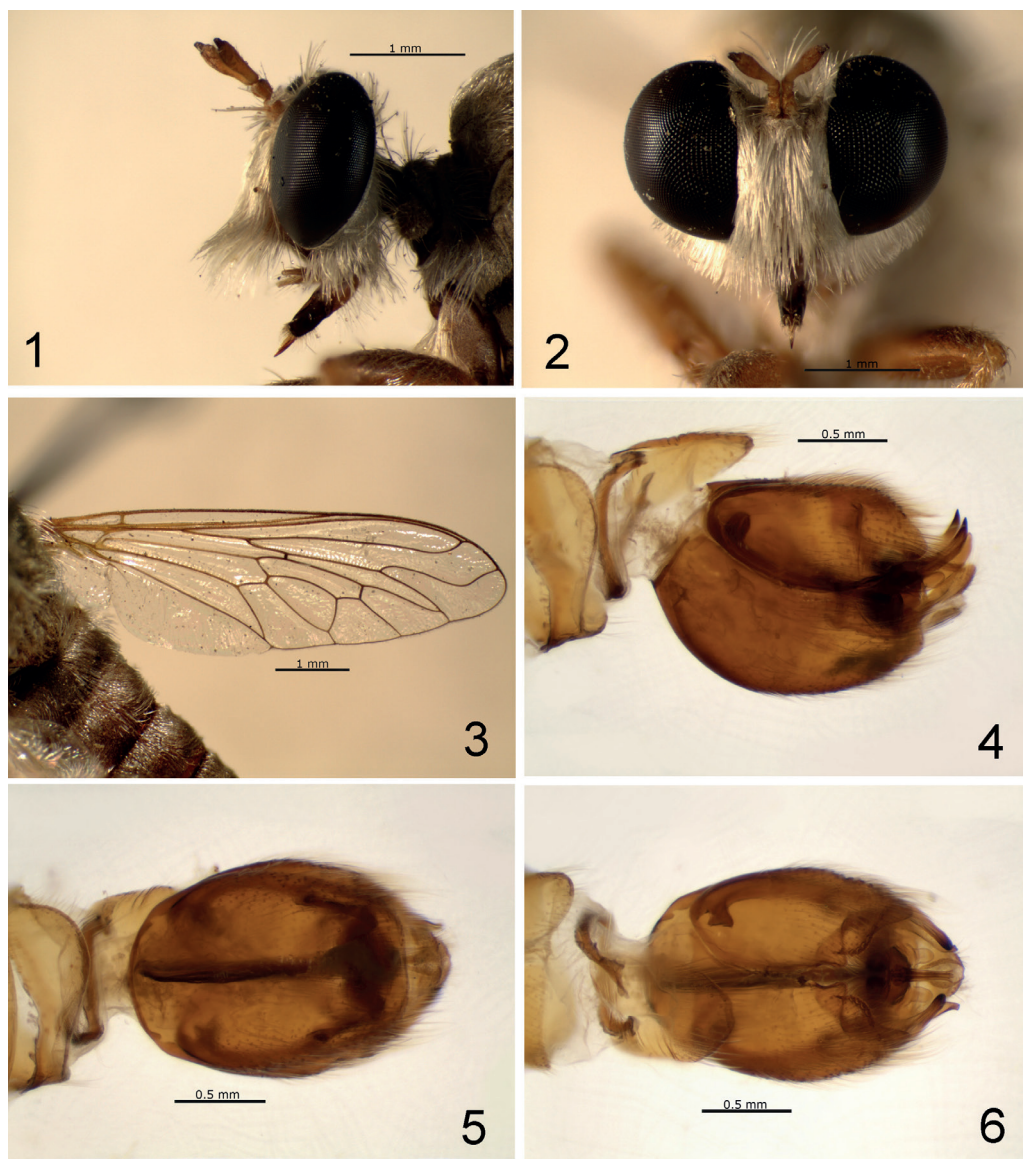
REFERENCES

- Austen E.E. 1914. On Diptera collected in the western Sahara by Dr. Ernst Hartert, with

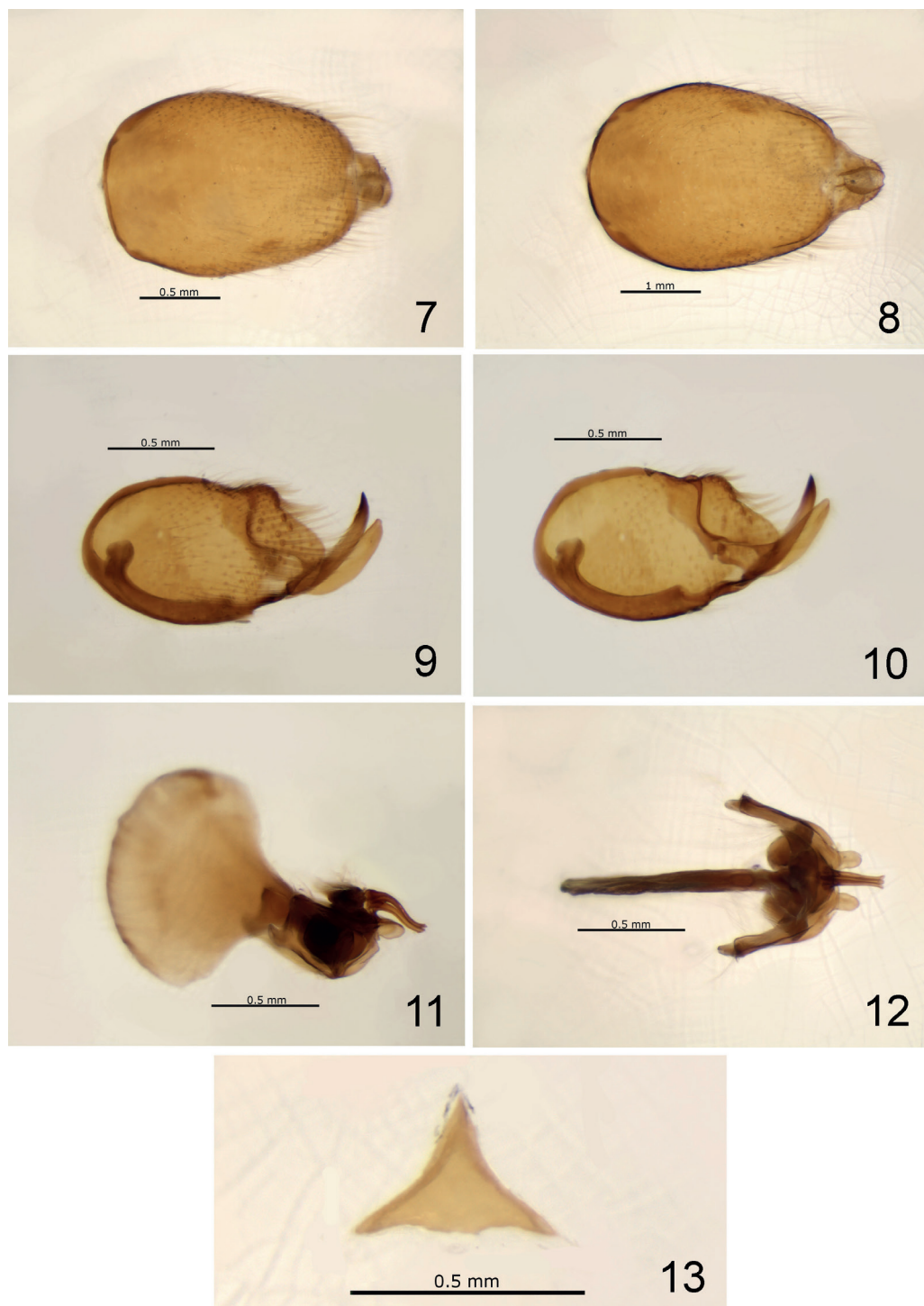
- descriptions of new species. *Novitates Zoologicae*, **21**: 265–274.
- Becker T.** 1907. Die Ergebnisse meiner dipterologischen Frühjahrsreise nach Algier und Tunis. *Zeitschrift für systematische Hymenopterologie und Dipterologie*, **7**: 33–61.
- Dikow T.** 2009. Phylogeny of Asilidae inferred from morphological characters of imagines. *Bulletin of the American Museum of Natural History*, **319**: 1–175.
- Kerzhner I.M.** (Ed.). 1972. *Nasekomye Mongolii*, **1**: 1–991. Leningrad: Nauka. (In Russian).
- Lehr P.A.** 1964. New genera and new species of the robber-flies (Diptera, Asilidae) in the fauna of the USSR. *Entomologicheskoe Obozrenie*, **43**(4): 914–935. (In Russian).
- Lehr P.A.** 1969. Assassin flies of the tribe Laphystini (Diptera, Asilidae) of the USSR fauna. *Zoologicheskii Zhurnal*, **48**(2): 233–240. (In Russian).
- Lehr P.A.** 1988. Family Asilidae. In: **Soós Á. & Papp L.** (Eds.). *Catalogue of Palaearctic Diptera. Athericidae – Asilidae*, **5**: 197–326. Budapest: Akadémiai Kiadó.
- Londt J.G.H.** 2008. A review of Afrotropical *Trichardis* Hermann, 1906, and the description of the first Oriental representative of the genus (Diptera: Asilidae: Laphriinae). *African Invertebrates*, **49**(2): 171–226.
- Richter V.A.** 1972. On the fauna of the robber flies of the subfamilies Dasypogoninae and Laphriinae (Diptera, Asilidae) of Mongolia. *Nasekomye Mongolii*, **1**: 385–390. Leningrad: Nauka. (In Russian).
- Richter V.A.** 1974. Robber flies of the subfamilies Dasypogoninae and Laphriinae (Diptera, Asilidae) from Mongolian People's Republic. II. *Nasekomye Mongolii*, **2**: 304–309. Leningrad: Nauka. (In Russian).
- Theodor O.** 1980. Diptera: Asilidae. *Fauna Palaestina. Insecta*, **II**. Jerusalem: Israel Academy of Science and Humanities. 446 p.
- Séguy E.** 1934. Diptères d'Afrique. *Encyclopédie Entomologique*, Serie B/II, Diptera, **7**: 63–80. Paris.

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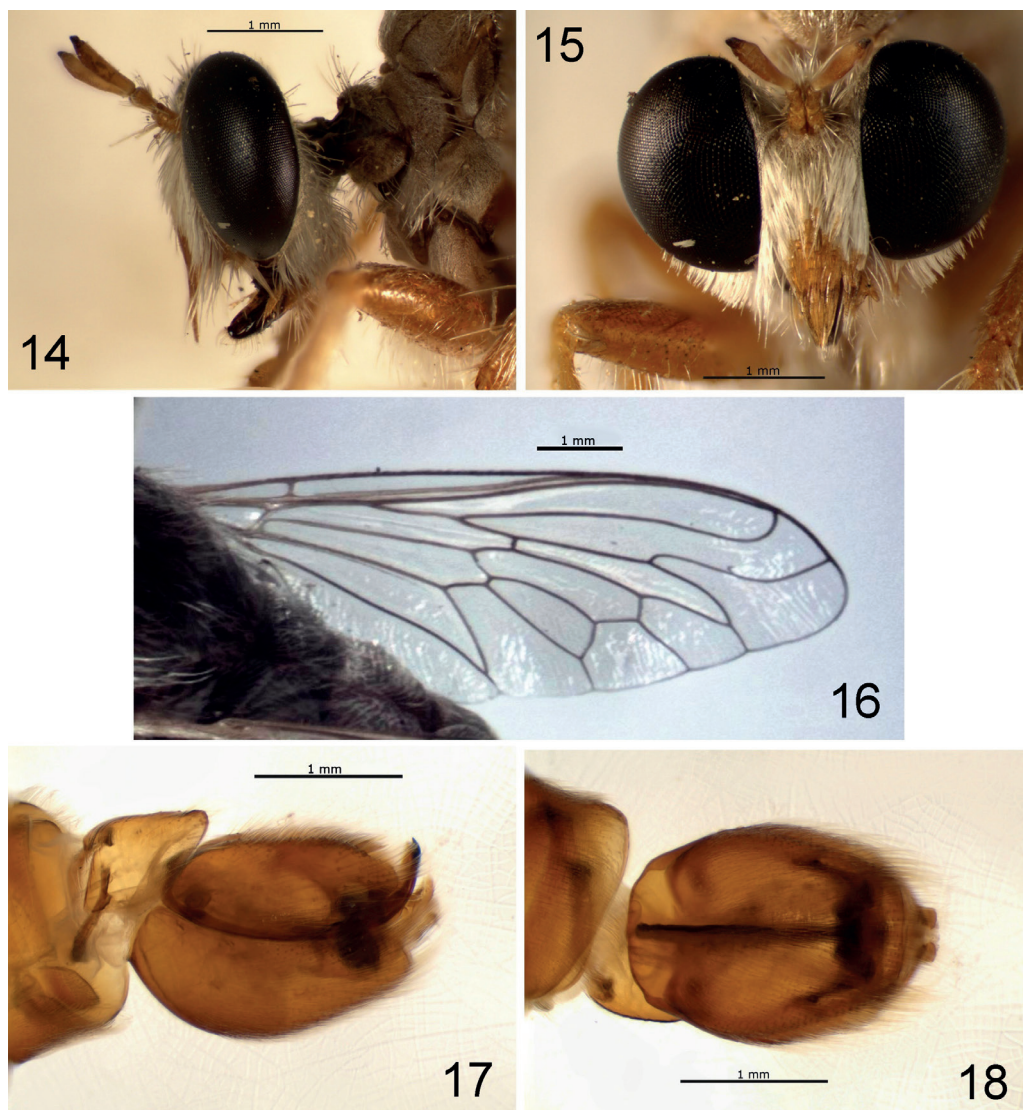
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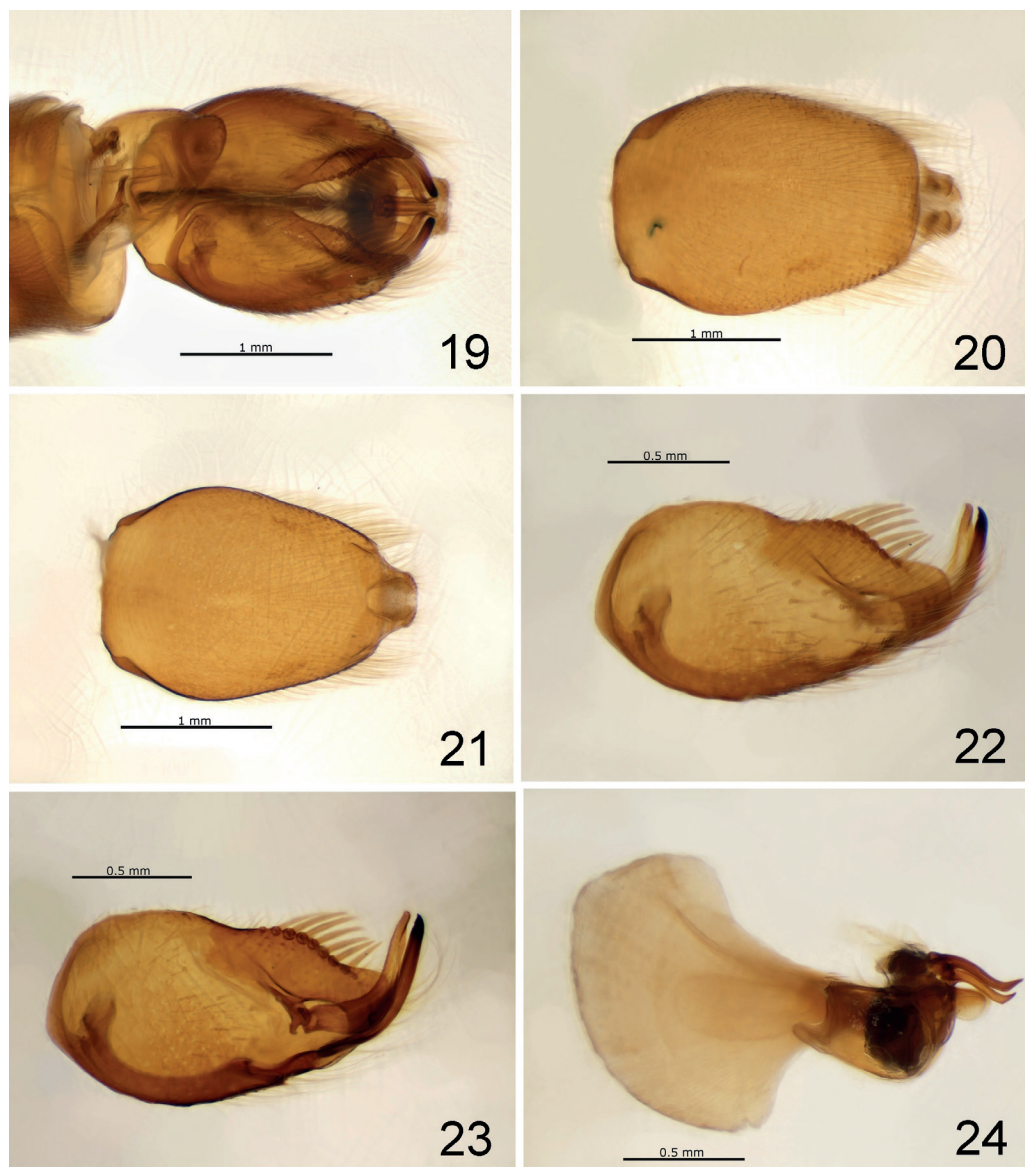
Figs 1–6. *Trichardis lehri* sp. nov., male (paratype). Head, lateral view (1) and anterior view (2); wing (3); male genitalia, lateral view (4), dorsal view (5) and ventral view (6).



Figs 7–13. *Trichardis lehri* sp. nov., male (paratype). Epandrium, dorsal view (7) and ventral view (8); lateral external surface of gonopod (9); lateral internal surface of gonopod (10); aedeagus, lateral view (11) and dorsal view (12); hypandrium (anterior margin down) (13).



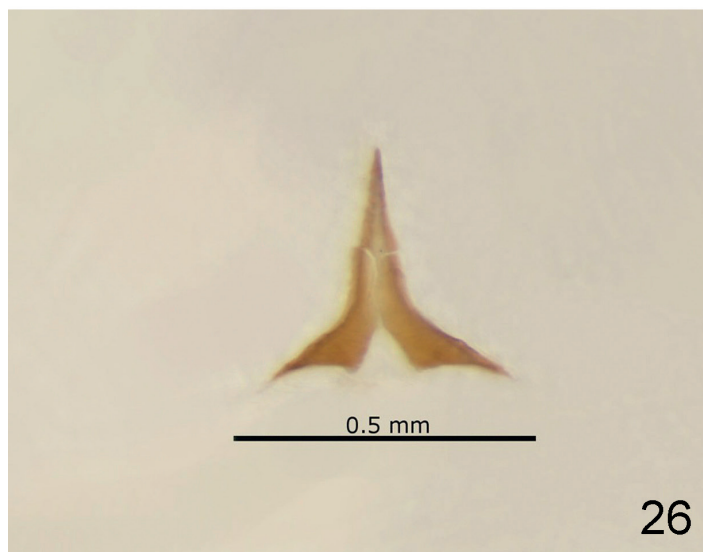
Figs 14–18. *Trichardis leucocoma* (van der Wulp), male. Head, lateral view (14) and anterior view (15); wing (16); male genitalia, lateral view (17) and dorsal view (18).



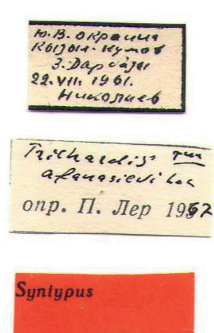
Figs 19–24. *Trichardis leucocoma* (van der Wulp), male. Male genitalia, ventral view (19); epandrium, dorsal view (20) and ventral view (21); lateral external surface of gonopod (22); lateral internal surface of gonopod (23); aedeagus, lateral view (24).



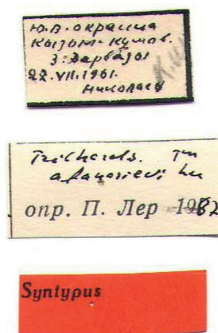
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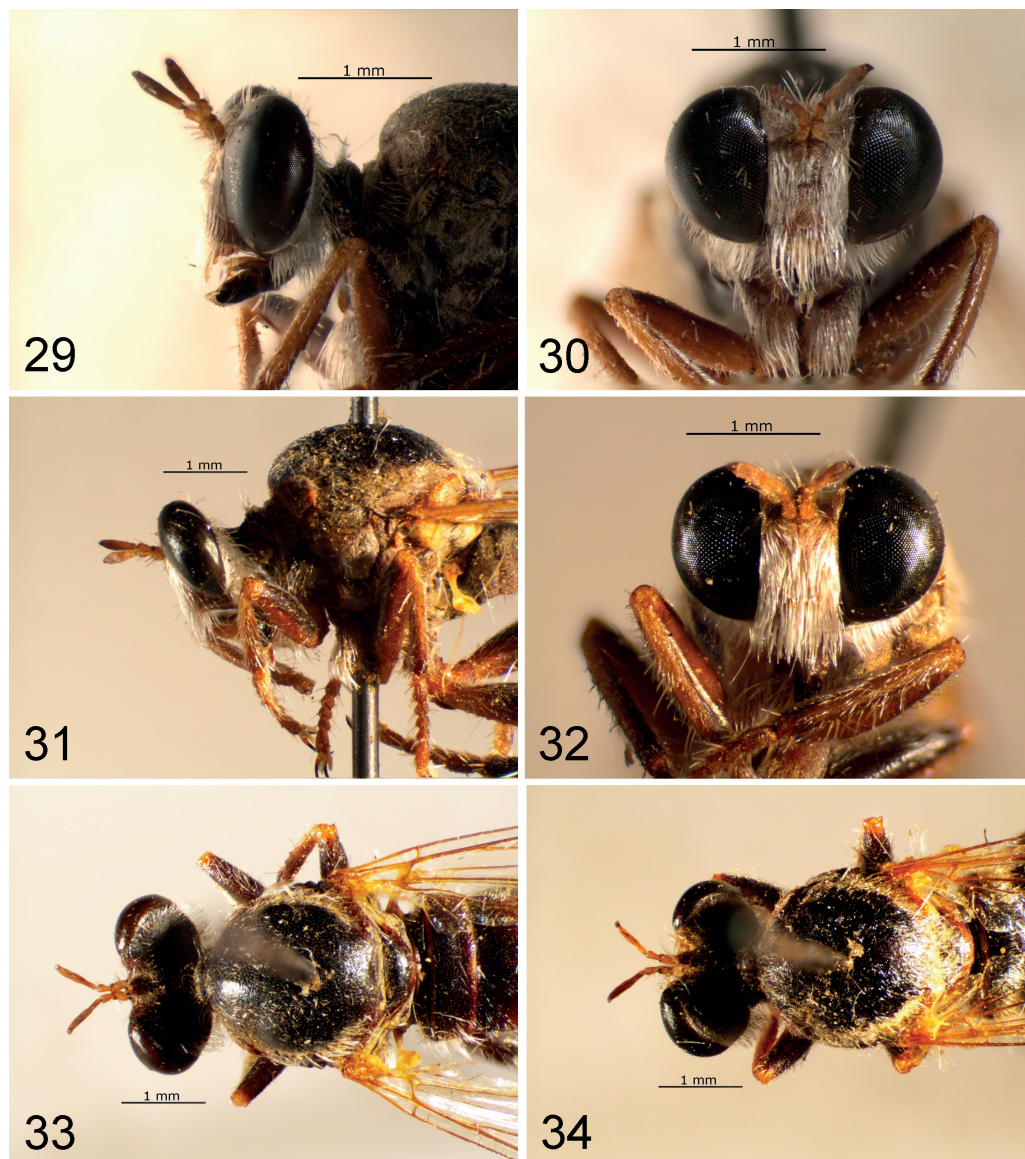


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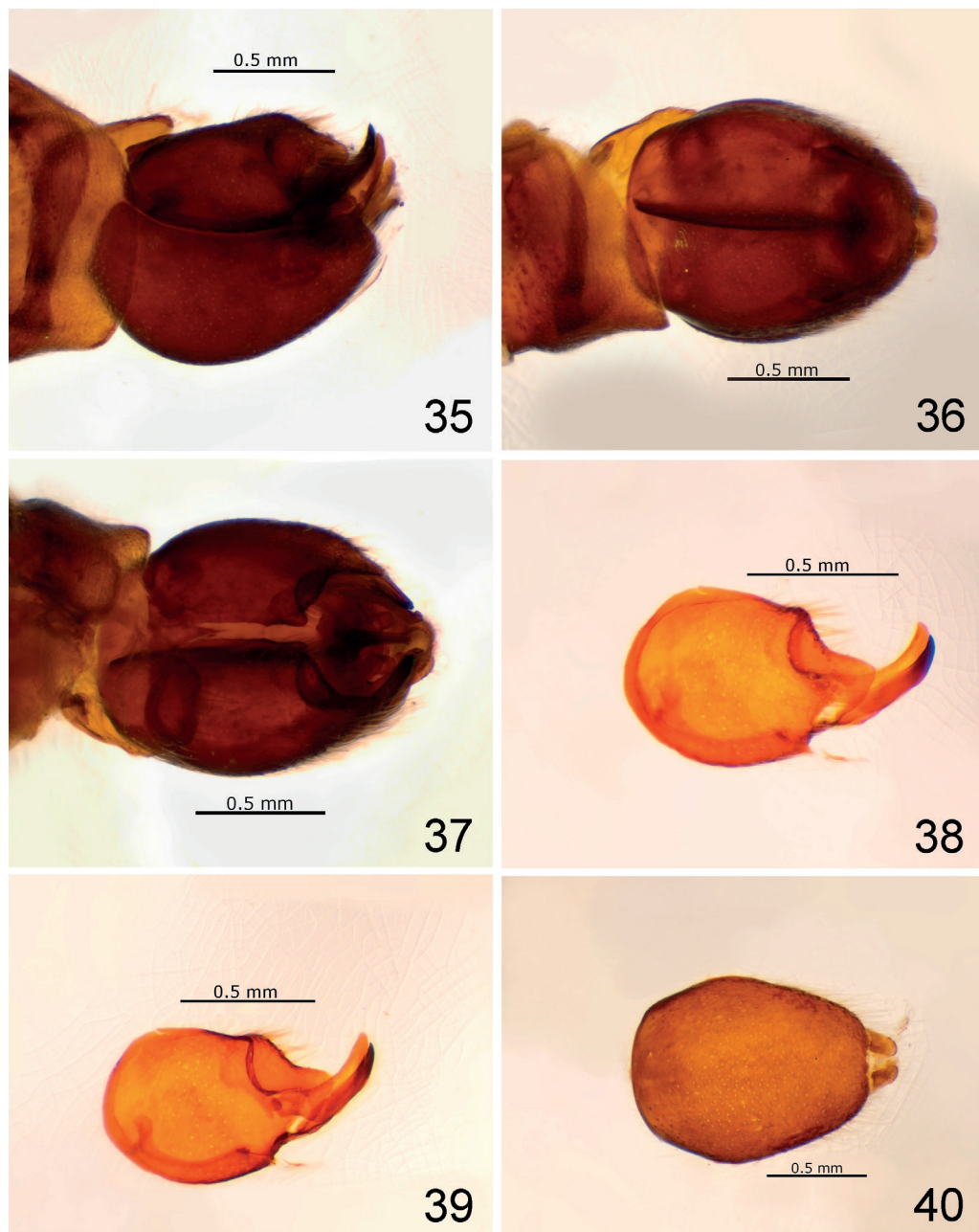


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Figs 25–28. *Trichardis leucocoma* (van der Wulp), male. Aedeagus, dorsal view (25); hypandrium (anterior margin down) (26); labels of the syntypes of *T. afanasievae* Lehr, male (27) and female (28).



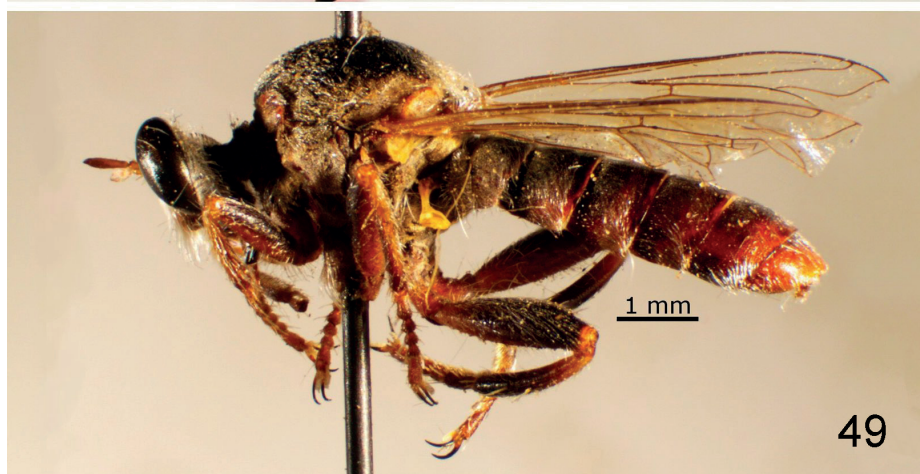
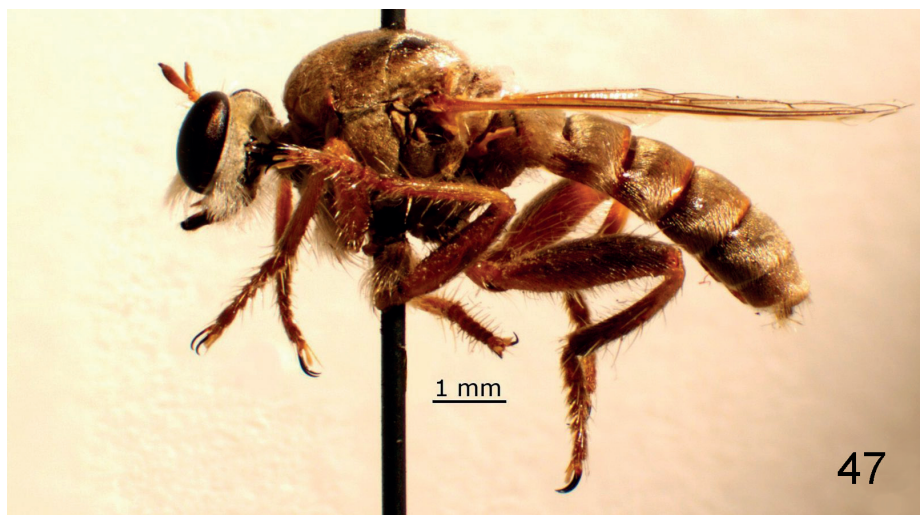
Figs 29–34. *Trichardis mongolica* V. Richter. Head of male, lateral view (29) and anterior view (30); head of female (holotype (?)), lateral view (31) and anterior view (32); thorax of male, dorsal view (33); thorax of female (holotype (?)), dorsal view (34).



Figs 35–40. *Trichardis mongolica* V. Richter, male. Male genitalia, lateral view (35), dorsal view (36) and ventral view (37); lateral external surface of gonopod (38); lateral internal surface of gonopod (39); epandrium, dorsal view (40).



Figs 41–46. *Trichardis mongolica* V. Richter. Epandrium, ventral view (41); aedeagus, lateral view (42) and dorsal view (43); hypandrium (anterior margin down) (44); labels of female (holotype(?)) (45) and male (46).



Figs 47–49. *Trichardis* spp., lateral view. *Trichardis leucocoma* (van der Wulp), female (47); *T. lehri* sp. nov., male (holotype) (48); *T. mongolica* V. Richter, female (holotype (?)) (49).

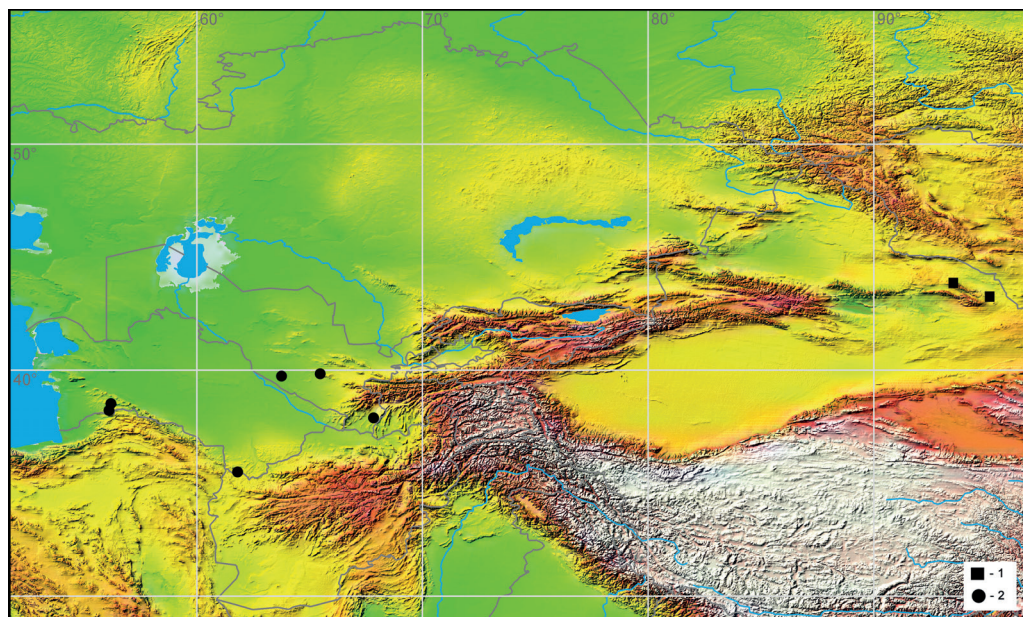


Fig. 50. Distribution of *T. mongolica* V. Richter (1) and *Trichardis lehri* sp. nov. (2).